

## ABSTRACT

An apparatus and method for transmitting a signal from a plurality of antennas. The apparatus includes an outer encoder configured to encode a stream of data according to a turbo multiple trellis coded modulation scheme, and generate a plurality of channel-coded symbol streams. The apparatus also includes an inner encoder serially concatenated with the outer encoder. The inner encoder is configured to receive the channel-coded symbol streams and provide space-time coding to the channel-coded symbol streams, thereby generating a plurality of space-time-channel-coded symbol streams. A plurality of antennas coupled are to the inner encoder, and each of the plurality of antennas is configured to transmit one of the plurality of space-time-channel-coded symbol streams.

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